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PCT-JP~1
SEQUENCE LISTING

<110> Toyota Jidosha Kabushiki Kaisha

<120> Method of Controlling Ethanol production

<130> PCTJP20007(TSN2002-299-WO-00)

<140>

<141>

<160> 39

<170> PatentIn Ver. 2.1

<210> 1

<211> 332

<212> PRT

<213> Bovine

<400> 1

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Met Ala Thr Leu Lys Asp Gln Leu Ile Gln Asn Leu Leu Lys Glu Glu
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His Val Pro Gln Asn Lys Ile Thr Ile Val Gly Val Gly Ala Val Gly
          20          25          30
Met Ala Cys Ala Ile Ser Ile Leu Met Lys Asp Leu Ala Asp Glu Val
          35          40          45
Ala Leu Val Asp Val Met Glu Asp Lys Leu Lys Gly Glu Met Met Asp
          50          55          60
Leu Gln His Gly Ser Leu Phe Leu Arg Thr Pro Lys Ile Val Ser Gly
          65          70          75          80
Lys Asp Tyr Asn Val Thr Ala Asn Ser Arg Leu Val Ile Ile Thr Ala
          85          90          95
Gly Ala Arg Gln Gln Glu Gly Glu Ser Arg Leu Asn Leu Val Gln Arg
          100          105          110
Asn Val Asn Ile Phe Lys Phe Ile Ile Pro Asn Ile Val Lys Tyr Ser
          115          120          125
Pro Asn Cys Lys Leu Leu Val Val Ser Asn Pro Val Asp Ile Leu Thr
          130          135          140
Tyr Val Ala Trp Lys Ile Ser Gly Phe Pro Lys Asn Arg Val Ile Gly
          145          150          155          160
Ser Gly Cys Asn Leu Asp Ser Ala Arg Phe Arg Tyr Leu Met Gly Glu
          165          170          175
Arg Leu Gly Val His Pro Leu Ser Cys His Gly Trp Ile Leu Gly Glu
          180          185          190
His Gly Asp Ser Ser Val Pro Val Trp Ser Gly Val Asn Val Ala Gly
          195          200          205
Val Ser Leu Lys Asn Leu His Pro Glu Leu Gly Thr Asp Ala Asp Lys
          210          215          220

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Glu Gln Trp Lys Ala Val His Lys Gln Val Val Asp Ser Ala Tyr Glu
 225 230 235 240
 Val Ile Lys Leu Lys Gly Tyr Thr Ser Trp Ala Ile Gly Leu Ser Val
 245 250 255
 Ala Asp Leu Ala Glu Ser Ile Met Lys Asn Leu Arg Arg Val His Pro
 260 265 270
 Ile Ser Thr Met Ile Lys Gly Leu Tyr Gly Ile Lys Glu Asp Val Phe
 275 280 285
 Leu Ser Val Pro Cys Ile Leu Gly Gln Asn Gly Ile Ser Asp Val Val
 290 295 300
 Lys Val Thr Leu Thr His Glu Glu Glu Ala Cys Leu Lys Lys Ser Ala
 305 310 315 320
 Asp Thr Leu Trp Gly Ile Gln Lys Glu Leu Gln Phe
 325 330

<210> 2
 <211> 971
 <212> DNA
 <213> *Saccharomyces cerevisiae*

<400> 2
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 aacaagctca tgcaaagagg tggtagccgc acgccgaaat gcatgcaagt aacctattca 120
 aagtaatatc tcatacatgt ttcatgaggg taacaacatg cgactgggtg agcatatgct 180
 ccgctgatgt gatgtgcaag ataaacaagc aagacggaaa ctaacttctt cttcatgtaa 240
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 tatttcttga gataagcaca ctgcacccat accttcctta aaagcgtagc ttccagtttt 360
 tgggtggttcc ggcttccttc ccgattccgc ccgctaaacg catatttttg ttgcctgggtg 420
 gcatttgcaa aatgcataac ctatgcattt aaaagattat gtatgctctt ctgacttttc 480
 gtgtgatgaa gctcgtggaa aaaatgaata atttatgaat ttgagaacaa ttctgtgttg 540
 ttacggtatt ttactatgga ataattaatc aattgaggat ttatgcaaa tatcgtttg 600
 atatttttcc gaccctttga gtacttttct tcataattgc ataatttgt ccgctgccc 660
 tttttctgtt agacggtgtc ttgatctact tgctatcggt caacaccacc ttattttcta 720
 actatttttt ttttagctca ttgaatcag cttatgggtg tggcacattt ttgcataaac 780
 ctagctgtcc tcgttgaaca taggaaaaaa aaatatatta acaaggctct ttcactctcc 840
 ttgcaatcag atttgggttt gttcccttta ttttcatatt tcttgtcata ttcctttctc 900
 aattattatt ttctactcat aaccacacgc aaaataacac agtcaaatac atcaaagatc 960
 cccaattct c 971

<210> 3
 <211> 999
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Modified DNA
 coding lactate dehydrogenase

<400> 3
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 aataaaatta ctattggttg tgttggtgct gttggtatgg cttgtgctat ttctattttg 120
 atgaaagatt tggctgatga agttgctttg gttgatgtta tggaagataa attgaaagg 180
 gaaatgatgg atttgcaaca tggttctttg tttttgagaa ctccaaaaat tgtttctggt 240
 aaagattata atgttactgc taattctaga ttggttatta ttactgctgg tgctagacaa 300
 caagaagggtg aatctagatt gaatttggtt caaagaaatg ttaatatatt taaatttatt 360

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attccaaata	ttgttaaata	ttctccaaat	tgtaaattgt	tggttggttc	taatccagtt	420
gatattttga	cttatgttgc	ttggaaaatt	tctggttttc	caaaaaatag	agttattggt	480
tctggttgta	atttggattc	tgctagattt	agatatttga	tggttgaaag	attgggtggt	540
catccattgt	cttgtcatgg	ttggattttg	ggtgaacatg	gtgattcttc	tgttccagtt	600
tggtctggtg	ttaatgttgc	tggtgtttct	ttgaaaaatt	tgcatccaga	attgggtact	660
gatgctgata	aagaacaatg	gaaagctggt	cataaacaag	ttgttgattc	tgcttatgaa	720
gttattaaat	tgaaagggtta	tacttcttgg	gctattggtt	tgtctgttgc	tgatttggct	780
gaatctatta	tgaaaaattt	gagaagagtt	catccaattt	ctactatgat	taaagggttg	840
tatgggtatta	aagaagatgt	ttttttgtct	gttccatgta	ttttgggtca	aaatgggtatt	900
tctgatgttg	ttaaagttac	tttgactcat	gaagaagaag	cttgtttgaa	aaaatctgct	960
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<210> 4

<211> 1052

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Modified DNA
coding lactate dehydrogenase

<400> 4

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atttctattt	tgatgaaaga	tttggctgat	gaagttgctt	tggttgatgt	tatggaagat	180
aaattgaaag	gtgaaatgat	ggatttgcaa	catggttctt	tgtttttgag	aactccaaaa	240
attgtttctg	gtaaagatta	taatgttact	gctaattcta	gattggttat	tattactgct	300
ggtgctagac	aacaagaagg	tgaatctaga	ttgaatttgg	ttcaaagaaa	tgtaatatatt	360
tttaaattta	ttattccaaa	tattgttaaa	tattctccaa	attgtaaatt	gttgggttgtt	420
tctaattccag	ttgatatttt	gacttatggt	gcttggaaaa	tttctggttt	tccaaaaaat	480
agagttattg	gttctggttg	taatttggat	tctgctagat	ttagatattt	gatgggtgaa	540
agattgggtg	ttcatccatt	gtcttgtcat	ggttggattt	tggttgaaca	tggtgattct	600
tctgtttccag	tttgggtctg	tgtaaatggt	gctgggtgtt	ctttgaaaaa	tttgcattca	660
gaattgggta	ctgatgctga	taaagaacaa	tggaaagctg	ttcataaaca	agttgttgat	720
tctgcttatg	aagttattaa	attgaaagg	tatacttctt	gggctatttg	tttgtctgtt	780
gctgatttgg	ctgaatctat	tatgaaaaat	ttgagaagag	ttcatccaat	ttctactatg	840
attaaagggt	tgtatggtat	taaagaagat	gtttttttgt	ctgttccatg	tattttgggt	900
caaaatggta	tttctgatgt	tgtaaaagtt	actttgactc	atgaagaaga	agcttggttg	960
aaaaaatctg	ctgatacttt	gtgggggtatt	caaaaagaat	tgcaatttta	ataactcgag	1020
cttgggttgaa	cacgttgcca	aggcttaagt	ga			1052

<210> 5

<211> 100

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer

<400> 5

acagaattca	caatggctac	tttgaaagat	caattgattc	aaaatttggt	gaaagaagaa	60
catgtttcac	aaaataaaaat	tactattggt	ggtgttggtg			100

<210> 6

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer

<400> 6
acagaattca caatggctac 20

<210> 7
<211> 100
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 7
atgataacaa ccacaaccac gacaaccata ccgaacacga taaagataaa actactttct 60
aaaccgacta cttcaacgaa accaactaca ataccttcta 100

<210> 8
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 8
atgataacaa ccacaaccac 20

<210> 9
<211> 100
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 9
tggttgatgt tatggaagat aaattgaaag gtgaaatgat ggatttgcaa catggttctt 60
tgtttttgag aactcctaaa attgtttctg gtaaagatta 100

<210> 10
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 10
tggttgatgt tatggaagat 20

<210> 11
<211> 100
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

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<400> 11
taacaaagac catttctaatt attacaatga cgattaagat ctaaccaata ataatgacga 60
ccacgatctg ttgttcttcc acttagatct aacttaaacc 100

<210> 12
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 12
taacaaagac catttctaatt a 21

<210> 13
<211> 100
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 13
tgaatctaga ttgaatttgg ttcaaagaaa tgttaatat tttaaattta ttattccaaa 60
tattgttaaa tattctccaa attgtaaatt gttggttgtt 100

<210> 14
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 14
tgaatctaga ttgaatttgg t 21

<210> 15
<211> 100
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 15
taacatttaa caaccaacaa agattaggtc aactataaaa ctgaatacaa cgaacctttt 60
aaagacacaa aggtttttta tctcaataac caagaccaac 100

<210> 16
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 16
taacatttaa caaccaacaa a 21

<210> 17
<211> 100
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 17
agagttattg gttctggttg taatttggat tctgctagat ttagatattt gatgggtgaa 60
agattgggtg ttcattccatt gtcttgatcat ggttgattt 100

<210> 18
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 18
agagttattg gttctggttg t 21

<210> 19
<211> 100
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 19
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acaattacaa cgaccacaaa gaaacttttt aaacgtaggt 100

<210> 20
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 20
cagaacagta ccaacctaaa a 21

<210> 21
<211> 100
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 21

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ctttgaaaaa tttgcatcca gaattgggta ctgatgctga taaagaacaa tggaaagctg 60
ttcataaaca agttgttgat tctgcttatg aagttattaa 100

<210> 22
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 22
ctttgaaaaa tttgcatcca g 21

<210> 23
<211> 100
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 23
agacgaatac ttcaataatt taactttcca atatgaagaa cccgataacc aaacagacaa 60
cgactaaacc gacttagata atacttttta aactcttctc 100

<210> 24
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 24
agacgaatac ttcaataatt t 21

<210> 25
<211> 100
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 25
tatgaaaaat ttgagaagag ttcattcaat ttctactatg attaaagggtt tgtatgggtat 60
taaagaagat gtttttttct ctgttccatg tattttgggt 100

<210> 26
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 26

atgaaaaatt tgagaagagt

20

<210> 27
 <211> 100
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:primer

<400> 27
 gacaaggtac ataaaaccca gttttaccat aaagactaca acaatttcaa tgaaactgag 60
 tacttcttct tcgaacaaac ttttttagac gactatgaaa 100

<210> 28
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:primer

<400> 28
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<210> 29
 <211> 60
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:primer

<400> 29
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<210> 30
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:primer

<400> 30
 aaaaaatctg ctgatacttt g 21

<210> 31
 <211> 52
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:primer

<400> 31
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<210> 32
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 32
acgttaaaat tattgagctc g 21

<210> 33
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 33
atatatggat ccgcgtttat ttacctatct c 31

<210> 34
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 34
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<210> 35
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 35
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<210> 36
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 36
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<210> 37
<211> 20

<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 37
tggttgatgt tatggaagat 20

<210> 38
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 38
gacaaggtac ataaaaccca g 21

<210> 39
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer

<400> 39
gtaataaaca caccgccg 19